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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: PCT/SE90/00314 (22) International Filing Date: 10 May 1990 (10.05.90) (30) Priority data: 8901683-6 11 May 1989 (11.05.89) SE (71)(72) Applicant and Inventor: MICKOS, Kaj [SE/SE]; Prinsvägen 10, S-131 46 Nacka (SE). (74) Agent: OMMING, Allan; A Omming & Co, Bellmansgatan 24, S-116 47 Stockholm (SE). (81) Designated States: AT (European patent), BE (European patent), CA, CH (European patent), DE (European patent), DK (European patent), ES (European patent), FI, FR (European patent), GB (European patent), IT (European patent), JP, LU (European patent), NL (European patent), NO, SE (European patent), US.</p>		<p>Published <i>With international search report.</i></p>
<p>(54) Title: PACKAGING UNIT FOR SCREWS, NAILS OR OTHER ITEMS</p> <div> </div> <p>(57) Abstract</p> <p>The invention consists in a packaging unit for fasteners (2) comprising an elongated strip (4) of flexible material, one side of which is provided with transversal and closed storage compartments (6) each accommodating a fastener. The invention is characterized in that each storage compartment (6) on the side remote from the strip (4) is provided with a slot (8) which perforates the compartment wall and extends in the longitudinal direction of the compartment.</p>		

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PACKAGING UNIT FOR SCREWS, NAILS OR OTHER ITEMS

The present invention relates to a packaging unit which is intended for screws, nails or similar fasteners and which is of the type set forth in the preamble of the following claim.

When handling different fasteners, e.g. screws for wall-erection or wall-construction in building work, it is beneficial if the method of packaging applied allows all fasteners to be orientated in one and the same direction, thus increasing speed of fastener insertion and minimizing spillage.

It is also an advantage if handling of the fasteners can be minimized to the greatest possible extent, so as to avoid the risk of allergic reaction which may occur from physical contact with nickel-plated or chromium-plated screws.

The ability to handle fasteners without physical contact therewith also prevents injury to the worker's fingers caused by pricks from screwpoints and sharp metal flashes or chips remaining on the fasteners subsequent to manufacture.

At present, two main types of packages prevail:

I) Cartons or boxes containing single fasteners (e.g. screws) which the worker must pick from the carton or box and manually orientate before insertion, a procedure associated with the aforementioned hazards, notably orientation, spillage, allergic reaction, injuries to fingers and low fastener-insertion speeds. Moreover, dropped fasteners are likely to pierce

through the shoes of the worker and injure his/her feet, and also to pierce and damage the tyres of any vehicle and transport equipment that may be in the vicinity.

5

II) The other type of packaging commonly used is designed for fastener-insertion which, in some respect, can be referred to as automatic. This type of package is usually in strip form, with the fasteners orientated in one and the same direction and in mutually spaced relationship. This type of package can only be used together with those types of automatic screw tighteners or nailing machines for which they are specifically designed. For example, the fasteners cannot be removed individually from the package for insertion into a structure surface with the aid of a conventional screw driver.

The present invention combines the two above-mentioned requirements in one single package, allowing both non-handling removal of orientated fasteners or items and automatic feeding of the fasteners in automatic screw tighteners or nailing machines or the like.

This is achieved in accordance with the invention with a package having the characterizing features set forth in the following claim. The package has the form of a strip made of paper, plastic or any other appropriate material. The strip is provided with transverse compartments or pockets in which the fasteners are placed. The fasteners are neither glued, moulded nor by other means attached to the strip, but are held in place by the surrounding pressure of the compartment walls. The package is configured in such a way that each compartment is provided on one side

of the strip with a slot which extends in the longitudinal direction of the compartment. When the strip is in a normal position, i.e. straight, the slot is closed. When bending the strip, the slot will widen
5 at the same time as pressure from the compartment walls ceases, thus allowing a fastener to be removed or released from the package. The sloping compartment walls, diverging towards the slot, facilitate removal of the fastener even when the strip is moderately
10 bent or not bent at all.

The distinctive quality of the package of being able to open and close around the fastener with great precision and at high speed, allows not only both
15 manual and automatic handling of fasteners but also provides an opportunity of designing improved automatic screw tighteners and packaging machines.

The invention will now be described in more detail with reference to the accompanying drawings which
20 illustrate an exemplifying embodiment of the invention and in which

Figure 1 illustrates a coiled package loaded with screws;

25 Figure 2 illustrates part of a screw-loaded strip; and

Figure 3 is a cross-sectional view of a curved package loaded with two screws.

30 The drawing illustrates a package (strip) 1 which in the illustrated case is loaded with screws 2. The strip comprises transverse compartments comprising diagonal partitions 3 attached to a supporting strip 4 in manner such that every other compartment is a
35 blind compartment 5 and every other compartment a

packaging compartment 6. The packaging compartments are covered by lids 7 which are attached to the tops of the blind compartments and which, in the "roof" of the packaging compartments, form slots 8 which extend in the longitudinal direction of the compartment. When the strip is straight, the compartment slots are closed and the elastic or resilient partitions 3 between blind and packaging compartments press against the screw 2 and hold it in place. When the strip is bent, e.g. around an axis 9, the slot 8 will widen and cause the screw to fall out. The sloping walls 3 of the packaging compartments widen towards the slot 8, thus facilitating pressing of screws from the strip. It should be noted, however, that when using the inventive package to advance screws to a hand-held screw-tightener, it is intended that the strip and screws carried thereby shall be held in one hand while pressing screws from the package, one after the other, with the aid of the screw-tightener. The screws will therefore not come into contact with the fingers at all, which is highly advantageous and explains why work is carried out at an unbelievably high speed in comparison with packages with which screws must be picked losely therefrom.

CLAIMS

1. A packaging unit for screws (2), nails or like fasteners, comprising two outer, elongated and mutually parallel strips (4,7) and an intermediate, corrugated strip (3) with the crests of the corrugations connected to the outer strips (4,7) such as to form fastener-accommodating compartments (6), for which purpose only alternate compartments are used, c h a r a c t e r i z e d in that at least the outer strips (4,7) have a width which is substantially equal to the lengths of the fasteners (2) from one axial extremity to the other, and in that each of the walls of the fastener containing compartments (6) formed by solely one outer strip (7) has provided therein a slot (8) which extends in the cross-direction of the strip (7).

Fig. 1

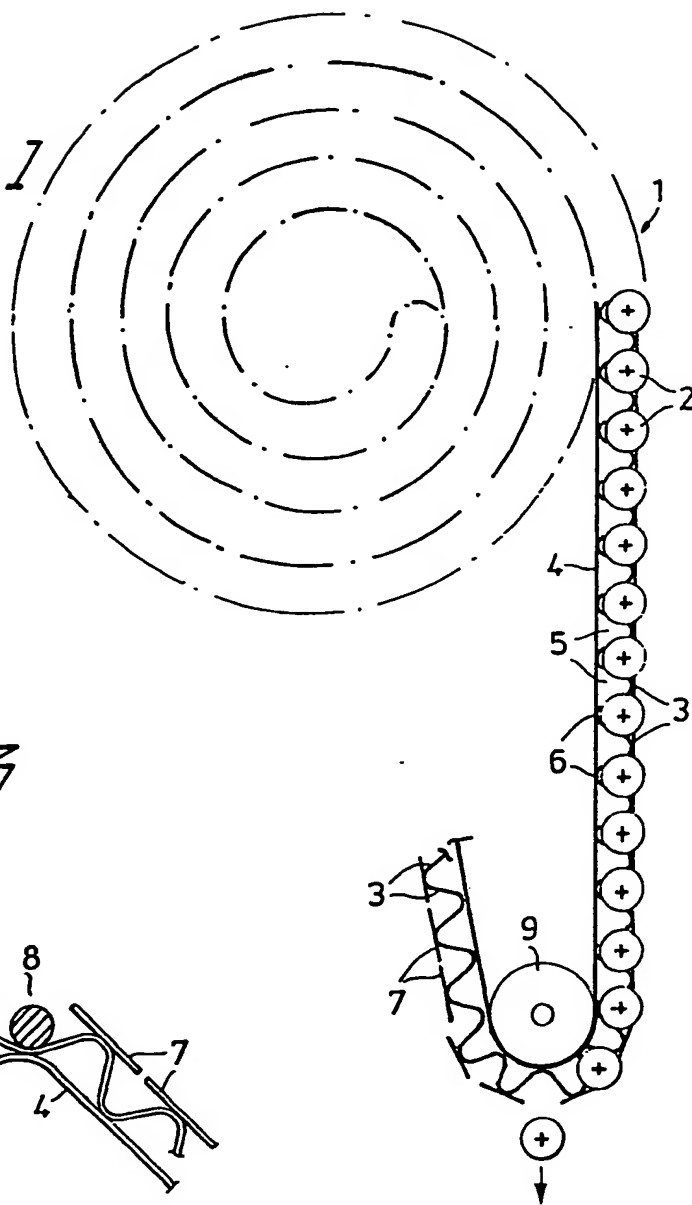


Fig. 3

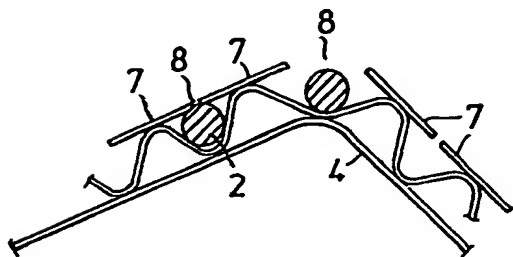
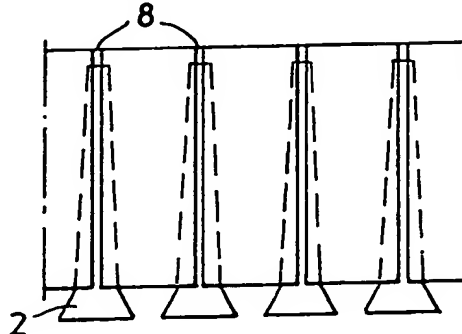


Fig. 2



INTERNATIONAL SEARCH REPORT

International Application No PCT/SE 90/00314

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC		
IPC5: B 65 D 73/02, F 16 B 15/08, 27/00		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
IPC5	B 25 C; B 27 F; B 65 D; F 16 B	
Documentation Searched other than Minimum Documentation to the extent that such Documents are Included in Fields Searched ⁸		
SE,DK,FI,NO classes as above		
III. DOCUMENTS CONSIDERED TO BE RELEVANT⁹		
Category *	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
X	US, A, 2881911 (D.F. KRILL) 14 April 1959, see the whole document --	1
X	US, A, 3067424 (H.T. DECOT ET AL) 11 December 1962, see the whole document --	1
A	US, A, 3031670 (F.S. SILLARS) 1 May 1962, see the whole document --	
A	GB, A, 1429455 (LE MAGNESIUM INDUSTRIEL) 24 March 1976, see the whole document --	
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>¹⁰ Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance, the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p> </div> </div>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
14th August 1990	1990 -08- 15	
International Searching Authority	Signature of Authorized Officer	
SWEDISH PATENT OFFICE	Helena Åkerlund / Helena Åkerlund	

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)		
Category *	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No
A	SE, C, 118344 (K.-V. R. BERGGREN) 11 March 1947, see the whole document --	
A	FR, A1, 2168423 (MONACELLI UMBERTO) 31 August 1973, see the whole document --	
A	EP, A1, 0320186 (KAWASHIMA, MASAKI) 14 June 1989, see the whole document -- -----	

**ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.PCT/SE 90/00314**

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the Swedish Patent Office EDP file on 90-06-27. The Swedish Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A- 2881911	59-04-14	NONE	
US-A- 3067424	62-12-11	NONE	
US-A- 3031670	62-05-01	NONE	
GB-A- 1429455	76-03-24	BE-A- 816211	74-12-12
SE-C- 118344	47-03-11	NONE	
FR-A1- 2168423	73-08-31	CA-A- 974945	75-09-23
		DE-A- 2300769	73-07-26
		GB-A- 1364401	74-08-21
		JP-C- 1074850	81-11-30
		JP-A- 49006564	74-01-21
		JP-B- 56018469	81-04-28
EP-A1- 0320186	89-06-14	AU-D- 2653388	89-06-08